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M. Babinet gives the following example for a place, the latitude of which is 51° 49′ north. Suppose the theodolite levelled, and the reading of the horizontal circle for the azimuth of the pole to be 67° (unknown); suppose, further, the two stars selected to be

ε Cassiopeæ R.A. = $1^{\mathrm{h}}\ 44^{\mathrm{m}}$ N.P.D. = $27^{\circ}\ 3'$

and

ο Urs. Maj. $8^{\mathrm{h}}\ 18^{\mathrm{m}}$ $28^{\circ}\ 48'$

and the observation to be made on the 1st of March, 1857.

A rough preliminary calculation by the relation

$$\cos h = \tan \delta \,.\, \tan \lambda$$

made with a guessed value of λ will show that ε *Cassiopeæ* will attain its greatest east elongation at about $6^{\mathrm{h}}\ 24^{\mathrm{m}}$ after noon, and ο *Urs. Maj.* its greatest west elongation at about $6^{\mathrm{h}}\ 37^{\mathrm{m}}$, the second observation following the first in about 13 minutes.

The horizontal circle-readings will be respectively for ε *Cassiopeæ* 114° 21′·2; for ο *Urs. Maj.* 15° 48′·1; whence we find

$$\tfrac{1}{2}(\mathrm{A}+\mathrm{A}') = +49^{\circ}\ 16'{\cdot}6$$

and by (3),

$$\begin{aligned} \tfrac{1}{2}(\mathrm{A}-\mathrm{A}') &= -\ 1\ 55{\cdot}0 \\ \mathrm{A} &= 47\ 21{\cdot}6 \text{ East} \\ \mathrm{A}' &= 51\ 11{\cdot}6 \text{ West} \end{aligned}$$

and by either (1) or (2),

$$\lambda = 51\ 49$$

To ascertain how the result would be affected by errors of observation, differentiate the equations (1) and (3), and it will be found that

$$d\lambda = \cot\lambda \,.\, \frac{\cos \mathrm{A} \,.\, \cos \mathrm{A}'}{\sin(\mathrm{A}+\mathrm{A}')} \,.\, d(\mathrm{A}+\mathrm{A}');$$

whence we may conclude that for such a pair of stars as the above, the error of the resulting latitude will scarcely exceed one-third of the error of the observed difference of azimuths.

At the conclusion of the ordinary business of the meeting, the Astronomer Royal exhibited and explained a model of the stand now in use at the Royal Observatory for the support of the mercury vessel of the reflex-zenith-tube. Considerable difficulty had been experienced, as is well known, in the use of this instrument on its first establishment, from the constant presence of tremor, and it was twice taken down and remounted in new positions, with little, if any, relief from the annoyance sought to be avoided. Indeed, the continual agitation of the artificial horizon seemed to testify to a never-ceasing palpitation of the soil of the Greenwich hill. After alluding to the expedients which were previously and vainly resorted to, and which are recounted in the Annual Reports

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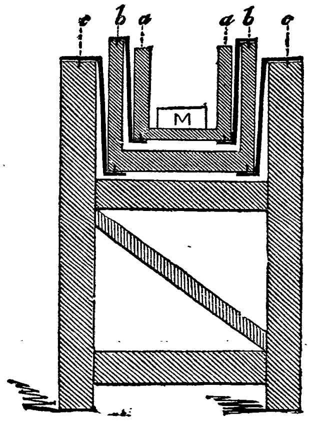
to the Board of Visitors, the Astronomer Royal turned to the model, and remarked that, at first sight, perhaps nothing could look more unpromising than the arrangement before his audience, the parts of which admitted of free motion in every direction, and seemed directly and intentionally opposed to the ideas of fixity and permanence.

The mercury vessel M rests on the bottom of a wooden frame *aa*, supported by broad bands of vulcanised caoutchouc attached to a second frame *bb*, which is itself similarly connected with a very solid stand *cc*. The vertical tremors were found to be entirely annihilated by this mode of suspension, and there remained only a slight horizontal swimming of the image which was at once cut off by connecting frames *a* and *c* horizontally by two fine shreds of the same elastic material. The vibrations of the soil are thus spent upon the elastic parts of the apparatus, and the inertia of the supported parts allowed to have free and beneficial action.



The subject has been already touched upon in the Annual Report, but the woodcut may make the explanation of the arrangement a little clearer.

Mr. William Taylor, in a letter to one of the Secretaries, says that he has found an artificial horizon of pitch a very convenient one under certain circumstances, such as when a reflexion observation has to be obtained in a situation much exposed to wind. He recommends heating the pitch in a flat pan, filtering it through muslin, and conveying the pan, with the pitch still in a thoroughly fluid state, to the support on which it is intended to rest, leaving it to cool with a cover over it. He remarks that a perfectly horizontal surface is thus obtained, a fact we should be much inclined to doubt, where the vessel and support have thus been greatly heated and cooled.

Two New Comets.

A comet was discovered by Professor D'Arrest at Leipsic on the 22d of February, in the following position,—

1857, Feb. 22. 16^{h} 40^{m} Leipsic M.T., R.A. 320° 37′ N.P.D. 67° 56′

The following two positions have been obtained at Redhill,—

	G.M.T.	App. R.A.	App. N.P.D.	Comps.	Stars.
1857	h m s	h m s	° ′ ″		
Feb. 28	17 23 32	21 43 28·9	63 5 27	3	*a*, *b*,
March 23	9 24 1	0 37 58·0	44 8 38	3	*c*, *d*.

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